(No Model.)

E. M. TURNER.

TRUCK FOR RAILWAY CARRIAGES.

No. 500,358. Patented June 27, 1893.

FIG. 1

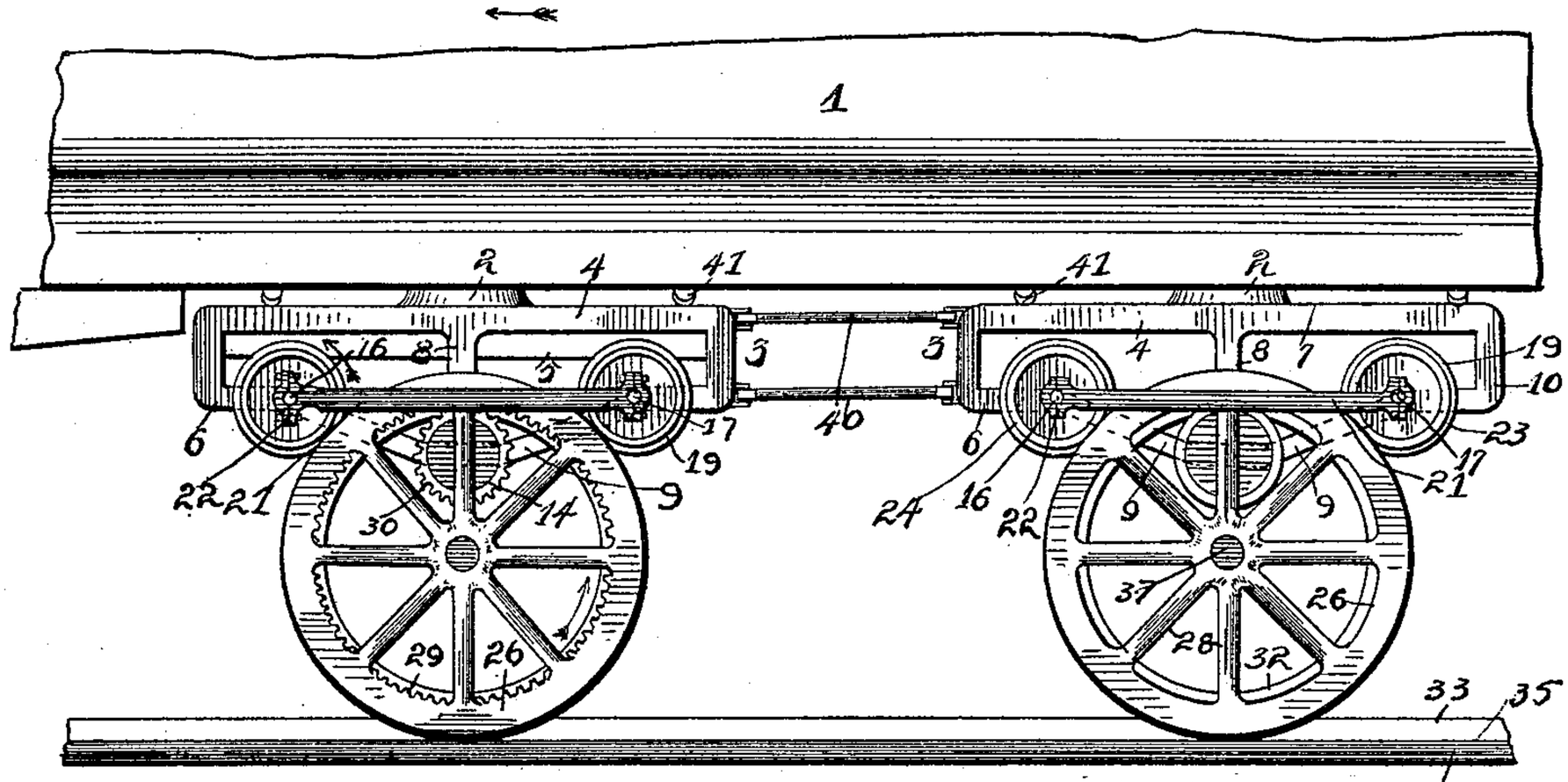


FIG. 2

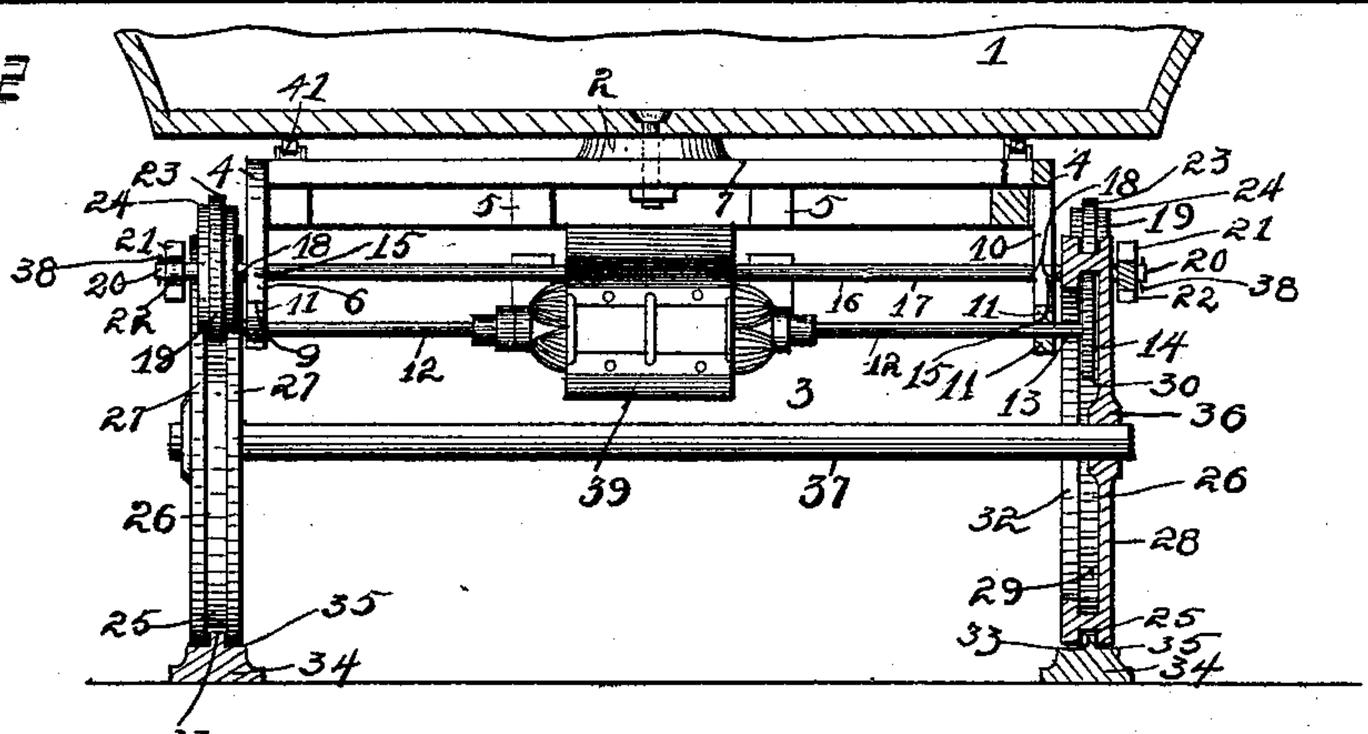
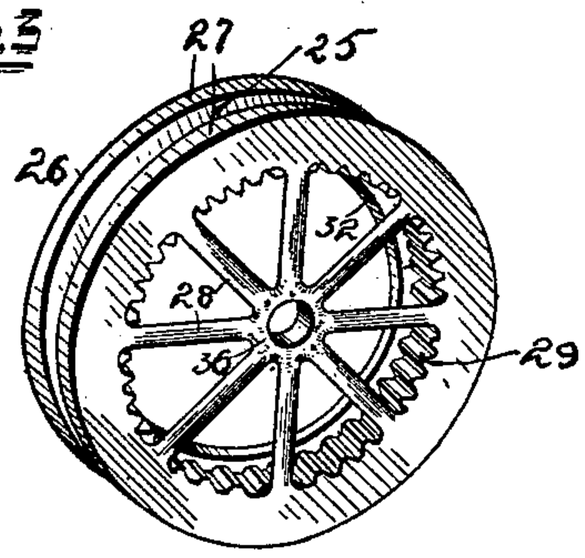


FIG. 3



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UNITED STATES PATENT OFFICE.

EPHRAIM M. TURNER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO R. E. MADDOX, OF FORT WORTH, TEXAS.

TRUCK FOR RAILWAY-CARRIAGES.

SPECIFICATION forming part of Letters Patent No. 500,358, dated June 27, 1893.

Application filed August 25, 1892. Serial No. 444,101. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM M. TURNER, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Trucks for Railway-Carriages and other Purposes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in trucks for railway carriages and other purposes, and consists in the novel arrangement and combination of parts as will be more fully hereinafter described and designated in the claims.

The principal feature and object of my invention is to construct surface-rollers which have their center of bearing above the center of the traction or suface roller, and which have traction rollers bearing upon the upper portion of the main surface-roller, and upon which the load is supported equally upon two points of the surface or traction roller.

The advantages gained by the application of my improvements, are apparent, as they include the development of a well known principle. It will be conceded that the gain in leverage obtained by applying the power near the top of the wheel is very great and the supporting of the load equally upon the front and rear portions of the upper part of the wheel will prove a decided advantage.

In the drawings: Figure 1 is a side elevation of my complete invention applied to an ordinary car, with parts broken away. Fig. 2 is an end vertical sectional view of one of the trucks, and showing in detail the position of parts. Fig. 3 is a view in perspective of the traction-roller made use of in carrying out my invention.

Referring to the drawings in illustrating my invention I have made use of a double swivel truck constructed to carry out the ideas of my invention, and support a car 1 by means of swivel blocks 2 which are of the ordinary construction.

The truck frame 3 is constructed as follows: An oblong-shaped end frame 4 is connected with a similar end frame upon the other side of the car by suitable cross-pieces and said end frames 4 have intermediate horizontal bars 5 running at right angles with the outside bars which connect the two end frames together. The lower cross-piece 6 of the end frames 4 is connected at a point intermediate of its length with the upper cross-piece 7 by a depending brace 8 which projects downwardly some distance below said cross-piece 6 and to the lower end of which are secured braces 9 which project therefrom upwardly to a point near the end pieces 10 of said frame 4. At the point where the depending brace 8 and the arms 9 connect, a proper bearing 11 is formed through which a shaft 12 projects upon and beyond both ends of said bearings 11, and upon the projecting ends 13 of which, are keyed gear wheels 14 for purposes hereinafter set forth. The point where the angular braces 9 are connected to the lower cross bar 6 provides bearings 15 through which shafts 16 and 17 run from one end of the truck to the other and project outwardly from said cross pieces 6 and have keyed upon their projecting ends 18 traction wheels 19 hereinafter described. The ends of said shafts 16 and 17 project outwardly at both ends 20 from the traction wheels 19 and upon said projecting ends are longitudinal, horizontal braces 21 which have bearings 22 in which said projecting ends 20 revolve, and said cross pieces 21 connecting together the two shafts 16 and 17 used in the construction of each set of wheels and their respective trucks.

I will now proceed to describe the construction of the traction wheels 19. As before stated, they are keyed upon the ends of the shafts 16 and 17 and are provided upon their outer peripheries with a center flange 23 which leaves two tread surfaces 24 upon each wheel. The center flange 23 of said traction wheels 19 is adapted to fit into an annular depression 25 in the periphery of each of the surface rollers 26, although there is no frictional connection between the edge or outer bearing surface of the flange 23 and the inner surface of the annular depression 25. The construction of the surface rollers 26 with the annular depression 25 just described, leaves two annular flanges 27 upon which the tread sur-

faces 24 of the frictional wheels 19 have their frictional bearings, and by which the weight of the load is sustained and carried, as hereinafter described. The internal construction of the surface rollers 26 is rather peculiar, in that the spokes and hub of said wheel are adjacent the outer portion of the wheel, that is the working parts of the wheel are located inside of the spokes 28 and toward each other. Interiorly adjacent the spokes 28 and upon the inside peripheries of the surface rollers 26 are gear teeth 29 into which the teeth 30 upon the internal pinion 14, fit. Between the teeth 29 and the inner edge of the roller 26 is a plain flange 32 which projects inwardly, and is of less diameter than the periphery of the gear 29 and consequently forms a guide for controlling the travel of the pinion 14. The annular flange 25 is also adapted to fit over the central flange 33 of a rail 34, the upper surface of said flange 33 being of less depth than that of the depression 25 in order that there will be no bearing frictional surface between it and the surface of the depression 25, the same merely serving the purpose of a guide, while the weight is supported upon the tread surfaces 35 of the rail 34. The two surface rollers have their hubs 36 connected by an axle or bar 37, the object of which is to keep the surface rollers 26 in a rigid vertical position and to prevent the same from spreading laterally. In the foregoing descriptions I have described the parts of this construction as applied to a motor car, that is a car to which an element of motion is applied direct and before describing any other construction I will detail the entire arrangement of the parts. By referring to the left hand figure of Fig. 1, it will be seen that the position of the pinion 14 is in the interior of the upper portion of the surface roller 26 and consequently the power is applied at that point. The two friction wheels 19 are supported by the truck frame 3 and revolve upon shafts 16 and 17, and have a bearing upon the flanges 27 of the surface roller 26. The wheels are kept in a true horizontal alignment by a cross brace 21 having bearings in both ends, which fit over the projecting ends 20 of the shafts 16 and 17, and have a key pin 38 or some similar device for preventing the braces 21 from slipping off of their normal positions upon the projecting end 20 of the shaft 16. A shaft 12 used in this instance as an armature shaft passing through an electric motor 39 is secured to the truck frame 3 in a suitable manner and from which the entire device receives its motive power. Said shaft 12 is properly mounted in stationary bearings 11 and has keyed upon both of its ends toothed pinions 14, the teeth 30 of which engage in the teeth 29 of the surface rollers 26 and transmit the power received from the motive source on the axle 12, to said surface rollers 26. It will also be seen that the truck and surface rollers 26 are held in a rigid vertical alignment and position at three different points. The flange 33 upon the rail 34 engaging as it does the annular depression 25 in the surface rollers 26 guarantees the rigidity of said rollers at their lowest point, the axles 37 keep the surface rollers 26 in true alignment at the center and the engaging of the flange 23 upon the friction rollers 19 in the annular depression 25 in the surface rollers 26, keeps the upper points of said surface rollers 26 in a rigid alignment with other parts.

The source of power for revolving the surface rollers 26 may differ and the power be derived from electricity, steam, compressed air, or any of the elements now used for operating cars.

If the trucks designed and constructed after the method of my invention were to be used under trailer cars, passenger coaches, or other vehicles for transportation, which have the power indirectly applied, the teeth 29 upon the interior periphery of the surface roller 26 and the teeth 30 upon the pinion 14, would be done away with and in the place of the teeth 29 an ordinary friction bearing would be provided while a friction pinion with a smooth outer surface bearing would be used in the place of the gear pinion 14 and by this combination of parts, a frictional bearing alone would be derived.

In Fig. 1 of the illustrations I have shown a pair of single swivel-trucks properly connected for operation by rods or chains 40 which cross each other at a point intermediate of the inside end frames of said trucks and which are so mounted that the one truck will readily follow the other around a curve or preserve a rigidity of alignment upon a straight track.

To prevent any undue rocking of the trucks in a vertical manner, I have provided suitable friction rollers 41, which are secured upon the truck frames 3 and bear against the bottom floor of the car 1.

In summing up the points described I will endeavor to especially bring out the following main features of the construction.

It will be readily understood that the point of power leverage is applied at a point above the center of the surface rollers and as this is the appliance of a well-known principle, it will need very little explanation in this connection.

It is a well known fact that if the fulcrum of a lever be placed near the surface upon which said lever is being operated, the power given thereby is much less than if the fulcrum were placed higher up, and the farther from the surface, within a reasonable distance that said fulcrum be placed, the more power and pressure is derived thereby. Therefore if the car be moving in the direction as shown by the arrow in Fig. 1, the point of power would be where the frictional connection is made between the friction roller 19 at the right hand of said left hand truck, and the surface

roller 26. The load is consequently borne by the two friction rollers 19 and equally distributed, by the relative position of said rollers in front and behind the center of said surface roller 26.

The interlocking of the friction rollers 19 and the surface rollers 26 and a similar operation for connection between the surface rollers 26 and the track 34, might appropriately be termed an interlocking "tongue and groove" joint, as this is a principal feature of the application of these parts, and the main object of which is to prevent any undue lateral or vertical motion and movement from the proper alignment of the parts just named.

Having fully described my invention, what I claim is—

1. In a truck for railway carriages, the combination, with a surface roller, of bearing rollers mounted upon said surface roller above its center and at the front and rear edges thereof, an internal friction roller engaging the surface roller, and connections between the friction and bearing rollers; substantially as and for the purpose set forth.

2. In a truck for railway carriages, the combination, with a surface roller, of bearing rollers mounted thereon above its center and at the front and rear edges thereof, and internal friction roller and connections between the latter and the bearing rollers, whereby said friction roller is automatically held in positive engagement with the surface roller; substantially as and for the purpose set forth.

3. An improved truck for railway carriages and other purposes, in which the load has its bearing equally upon the front and rear of the surface rollers, above the center of said surface rollers, and the motive power applied to and above the center of said surface rollers, substantially as set forth.

4. An improved truck for railway carriages and other purposes, consisting of one or more surface rollers having friction rollers mounted thereon, in the front and rear and near the top of said surface rollers, and an internal friction roller having an upward bearing against the inner peripheries of said surface rollers, substantially as set forth.

5. An improved truck for railway carriages and other purposes, consisting of one or more surface rollers mounted thereon, to support the load and having an internal gear wheel having an upward bearing in gear teeth upon the inner peripheries of said surface rollers, substantially as set forth.

6. An improved truck for railway carriages and other purposes, in which the interlocking of tongue and groove surface rollers and rails, support parts in vertical alignment and prevent the spreading apart of said surface rollers, substantially as set forth.

7. An improved truck for railway carriages and other purposes, having surface rollers connected in pairs by shafts, keyed in the hubs of said surface rollers, and the interlocking of tongue and groove friction and surface rollers and tongue and groove surface rollers and rails, to prevent the spreading out of gage of the surface rollers, substantially as set forth.

8. An improved truck for railway carriages and other purposes, having surface rollers provided with annular depressions 25 in their outer peripheries, bearing flanges 27 formed by this construction, said surface rollers having an interior annular depression provided with gear teeth 29, an annular flange adjacent said gear teeth 29 upon one side, and the spokes 28 upon the other side, substantially as set forth.

9. An improved truck for railway carriages and other purposes, having surface rollers 26 provided with annular depressions in their outer peripheries, annular depressions in their inner peripheries, and friction rollers 19 adapted to bear upwardly against the bearing surface of the inner annular depression, substantially as set forth.

10. An improved truck for railway carriages and other purposes, having surface rollers 26 provided with annular depressions in their outer peripheries, friction rollers 19 having an annular flange 23 adapted to fit into said annular depression 25 and a rail 34 provided with a flange 33 adapted to fit into said annular depression 25, substantially as set forth.

11. An improved truck for railway carriages and other purposes, having surface rollers 26, provided with flanges 27 upon their outer peripheries, and said flanges 27 adapted to have a frictional bearing contact with the tread surfaces of the rail 24, substantially as set forth.

12. An improved truck for railway carriages and other purposes, having surface rollers 26, friction rollers 19 mounted upon the projecting ends 20 of a shaft 16, the flange 23 upon the peripheries of said friction wheels 19, fitting into an annular depression 25 in the outer peripheries of surface rollers 26, friction rollers 19 similarly mounted upon both ends of a shaft 17, and the projecting ends of said shafts 16 and 17 connected and held in horizontal alignment and rigidity, by connecting bars 21 provided with suitable bearings in which the projecting ends of said shaft revolve, substantially as set forth.

13. An improved truck for railway carriages and other purposes, having a truck frame 3, consisting of longitudinal and horizontal braces mechanically joined, a depending center brace 8 at both ends of said truck, connecting with braces 9, at a point below the end frames 4, and the connection of said braces 8 and 9 forming a bearing 11, in which a shaft 12 revolves, upon the projecting ends of which are mounted frictional or geared pinions, substantially as set forth.

14. An improved truck for railway carriages and other purposes, having a truck frame 3, having end frames 4, said end frames provided

with a lower cross-piece 6, having bearings therein for shafts 16 and 17, friction rollers 19, mounted upon both ends thereof, a shaft 12 mounted in bearings 11, geared pinions 14 mounted upon the projecting end of said shaft 12, said pinion 14 having an upward bearing in the inner peripheries of surface rollers 26, and power applied to said shaft 12 for operating said surface rollers, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EPHRAIM M. TURNER.

Witnesses:

HERBERT S. ROBINSON,

JULIAN C. HARVEY.